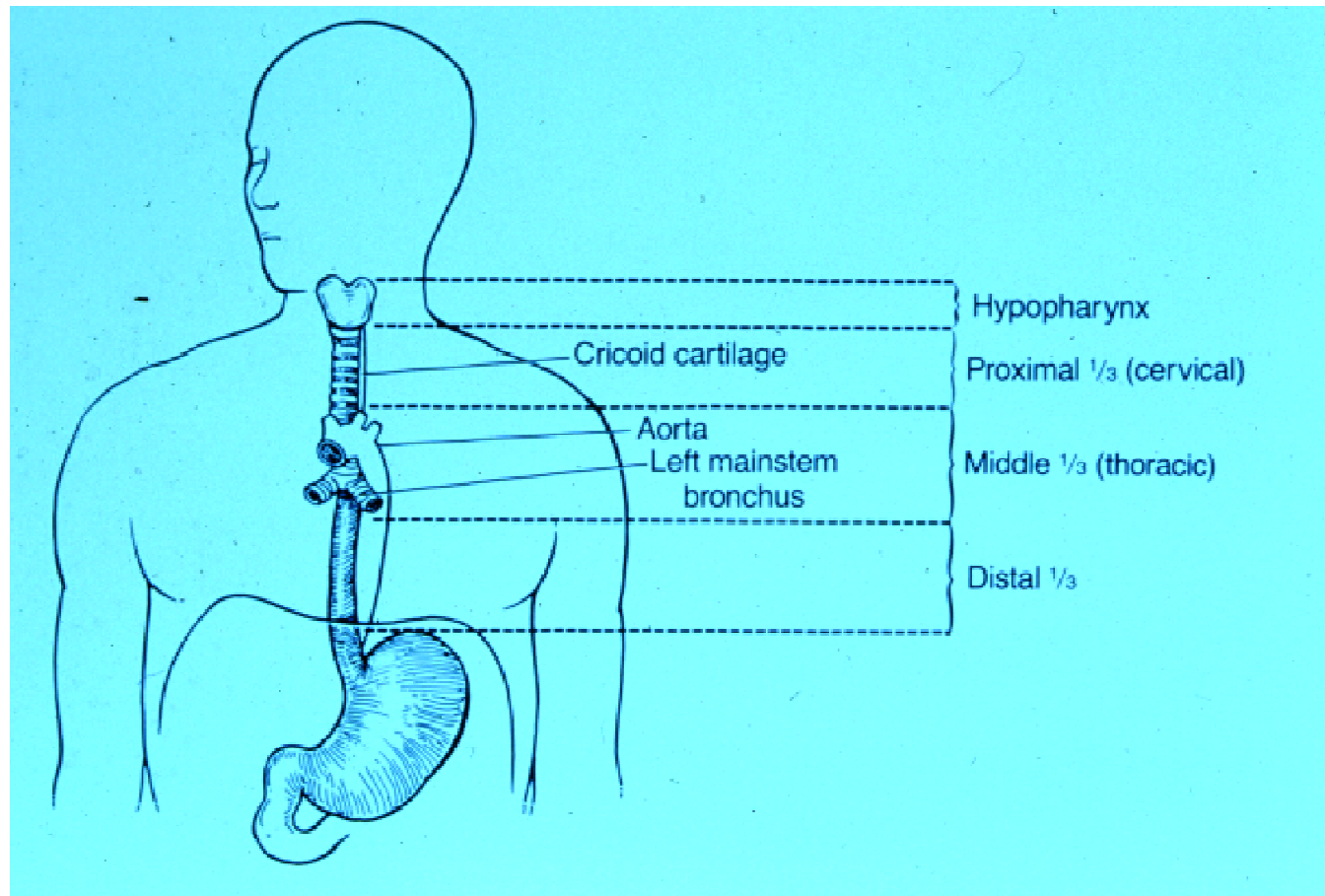


Diseases of the Esophagus

Surgical Diseases of the Esophagus

1. Hiatal Hernia
2. Reflux esophagitis
3. Esophageal motility disorders
4. Cancer
5. Esophageal disruption and trauma

Clinical Divisions of the Esophagus



General direction of the oesophagus is vertical

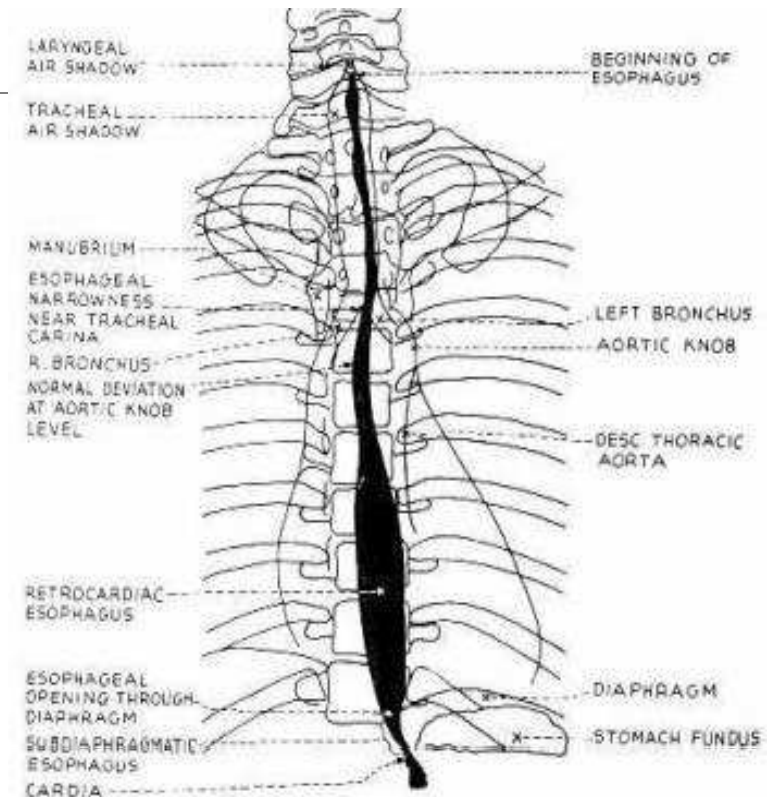
Presents two or three slight curvatures

At commencement, in the median line

Inclines to the left side at the root of the neck

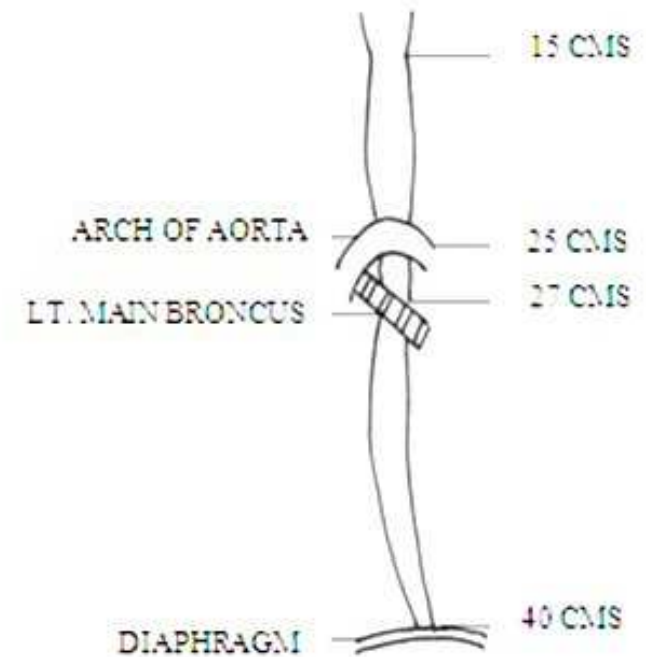
Gradually passes to the middle line

Again deviates to the left



Oesophagus is the narrowest region of alimentary tract except vermiform appendix. During its course it has three indentations:

- At 15 cm from incisor teeth is crico-pharyngues sphincter (normally closed) (UES)
- At 25 cm aortic arch and left main bronchus
- At 40 cms where it pierces the diaphragm where a physiological sphincter is sited (LES)



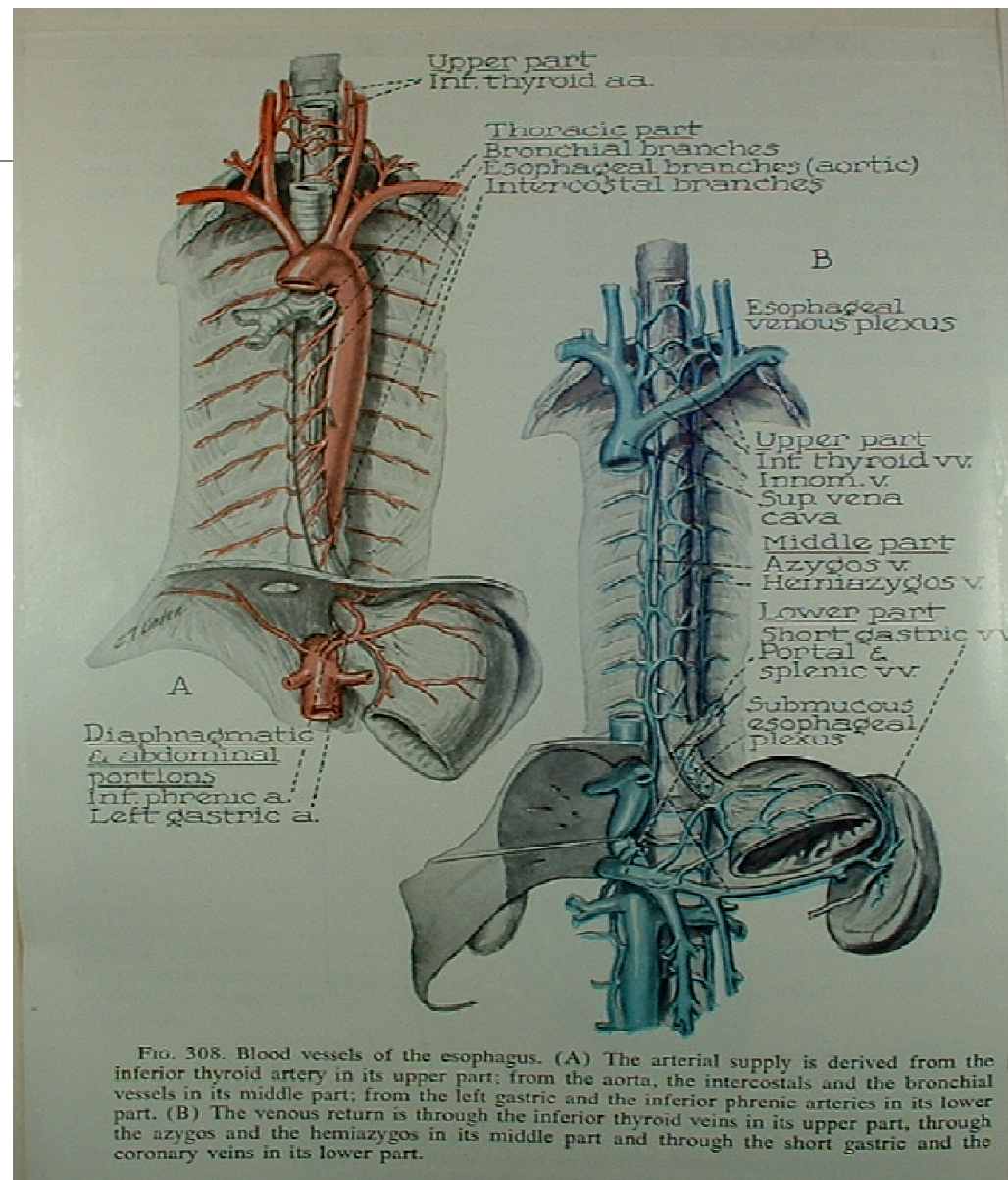
Source:

http://www.ispub.com/ispub/ijorl/volume_4_number_2_33/office_procedure_for_management_of_foreign_body_cricopharynx/body_fig1.jpg

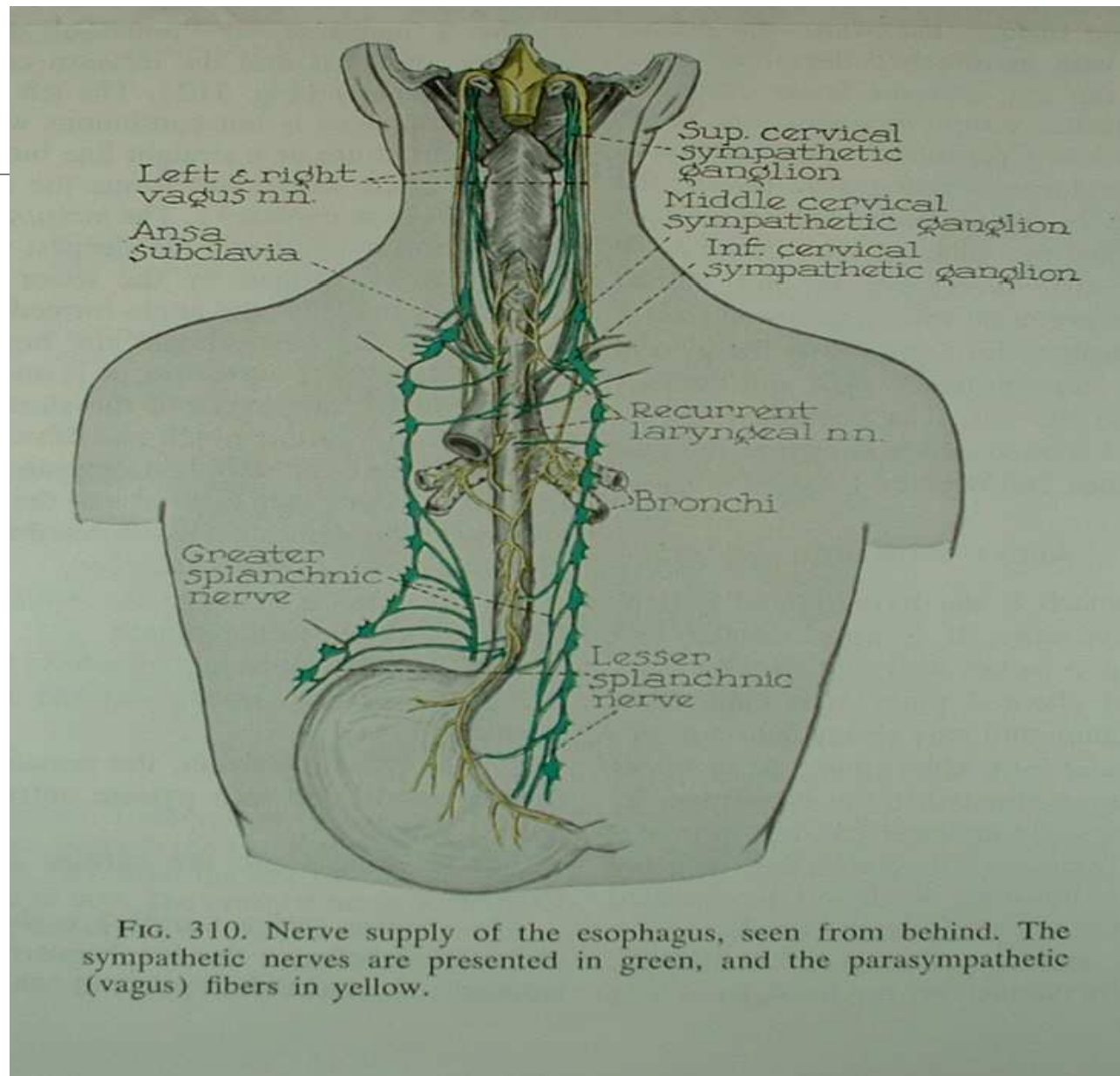
Esophagus

- Upper 1/3 is skeletal muscle
- Lower 1/3 is smooth muscle
- middle is combo of both
- Contains two sphincters
- Lined by squamous epithelium
- < 3 cm below diaphragm

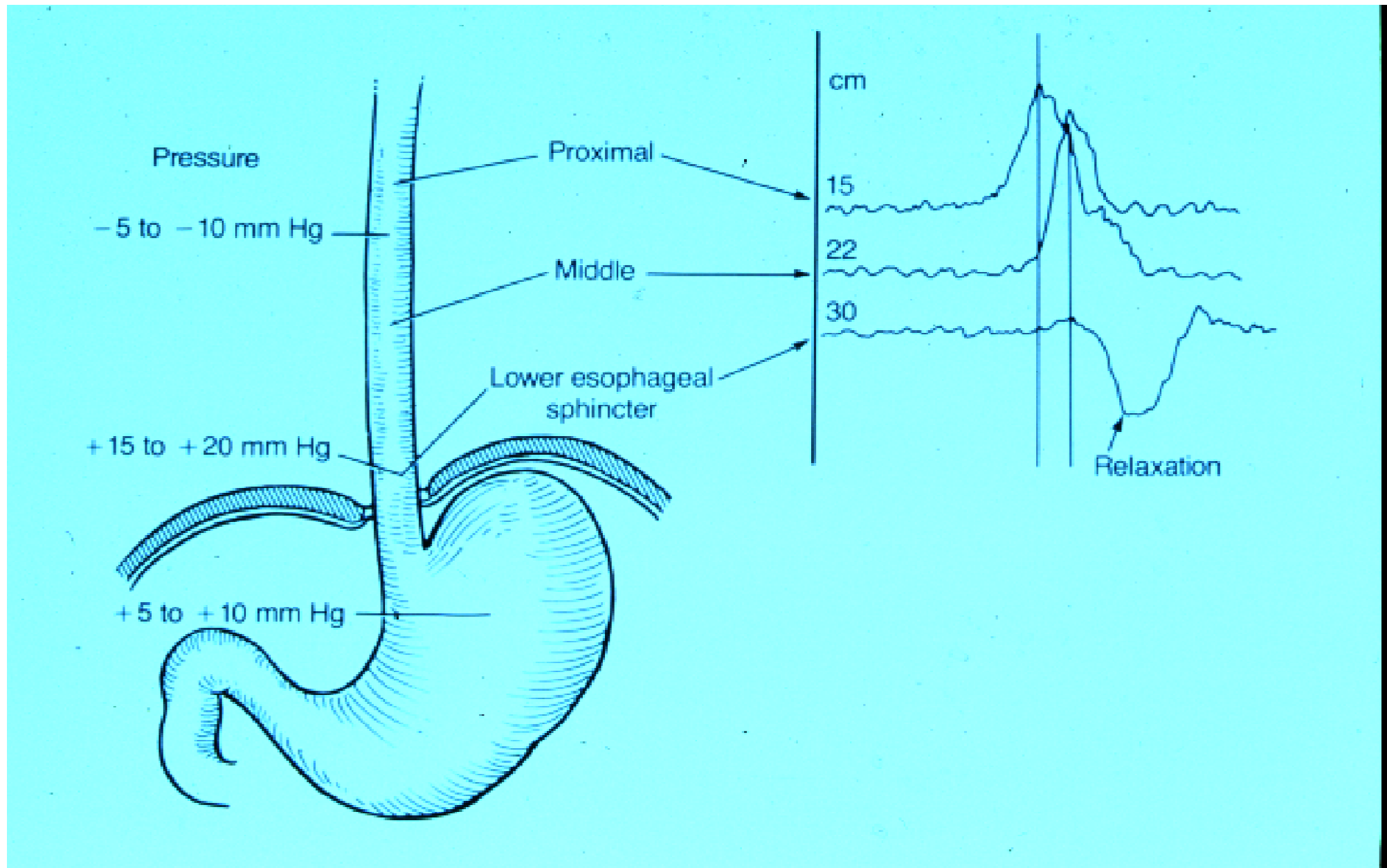
Vascular Supply to Esophagus



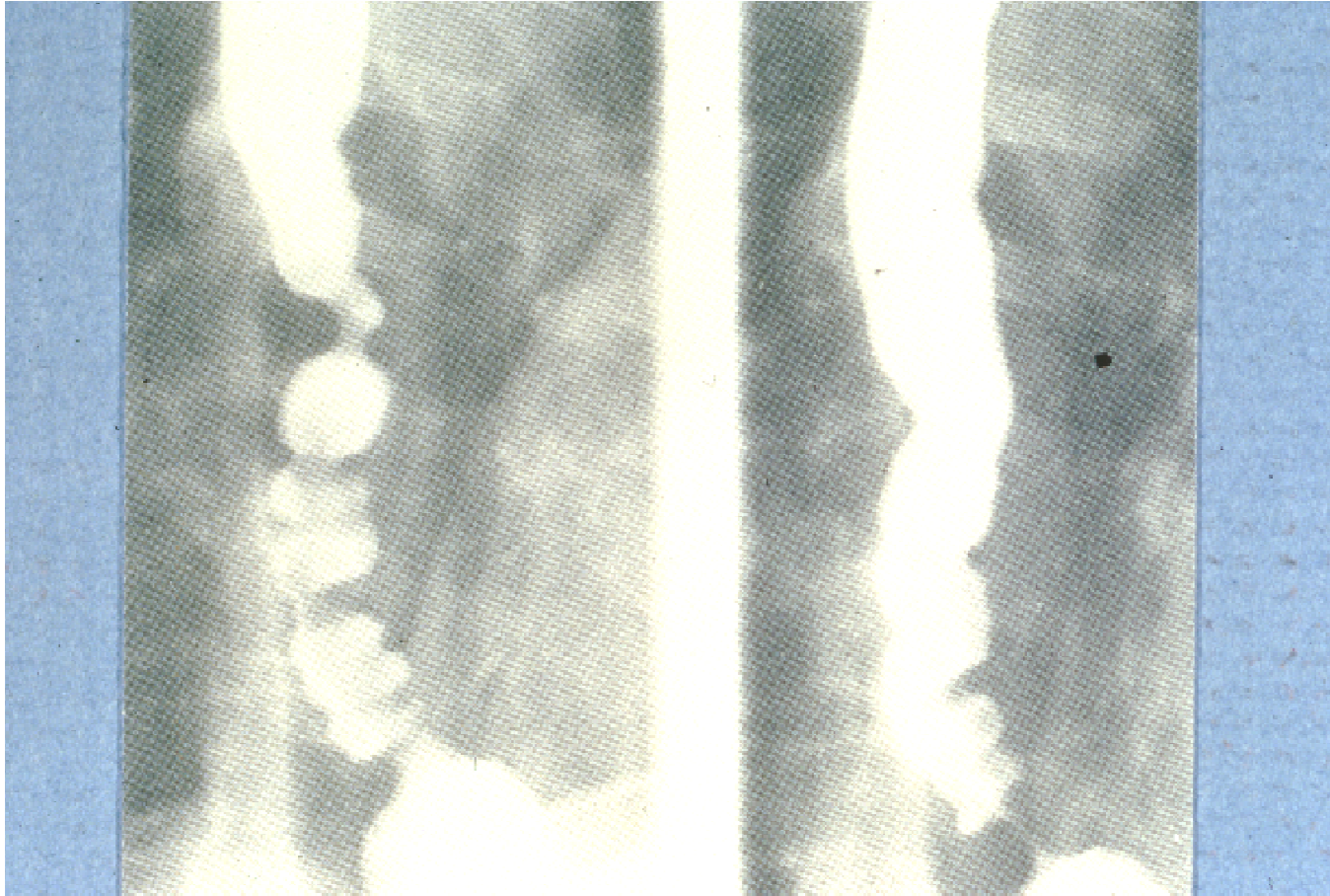
Nerve Supply of the Esophagus



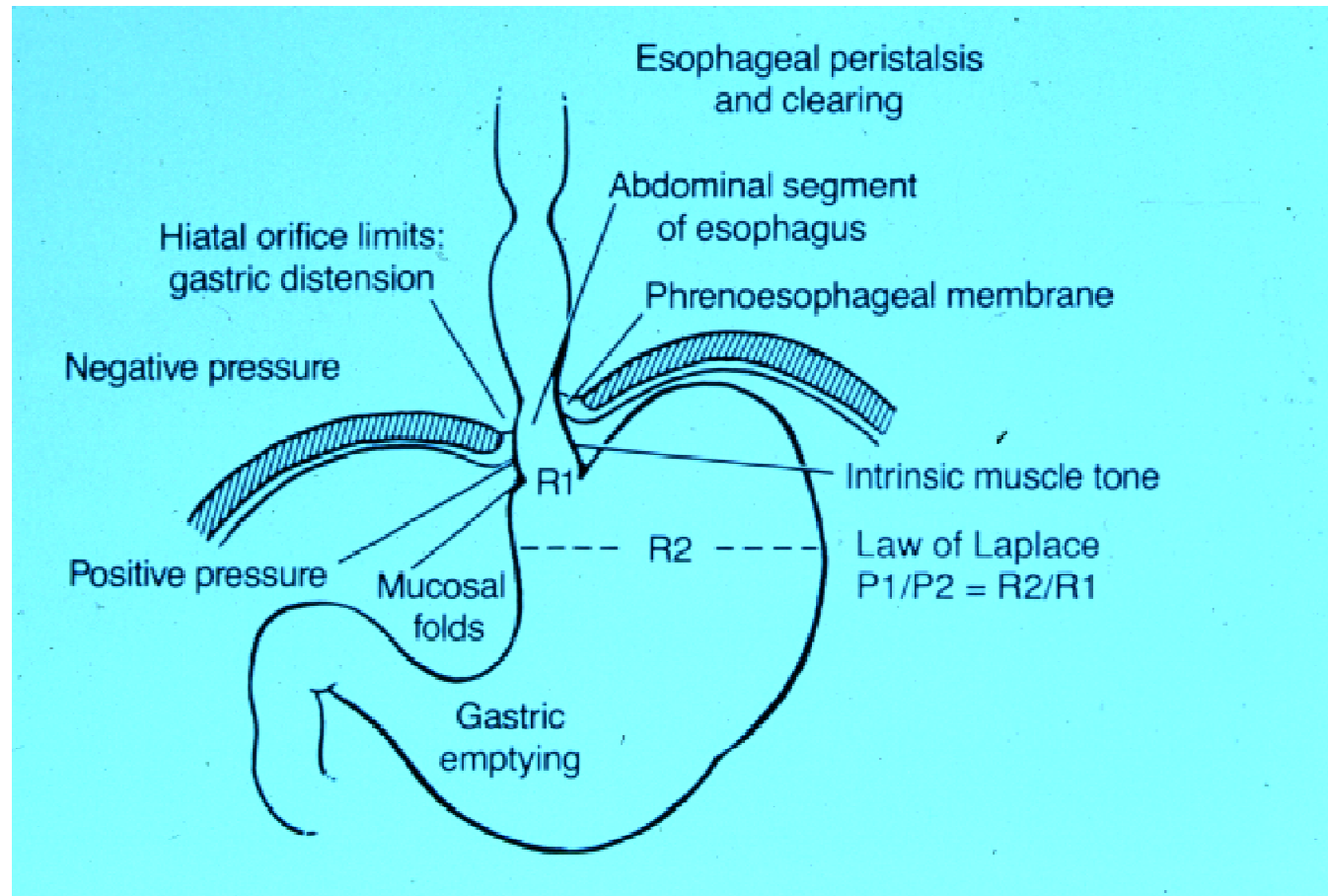
Motility -- Manometry



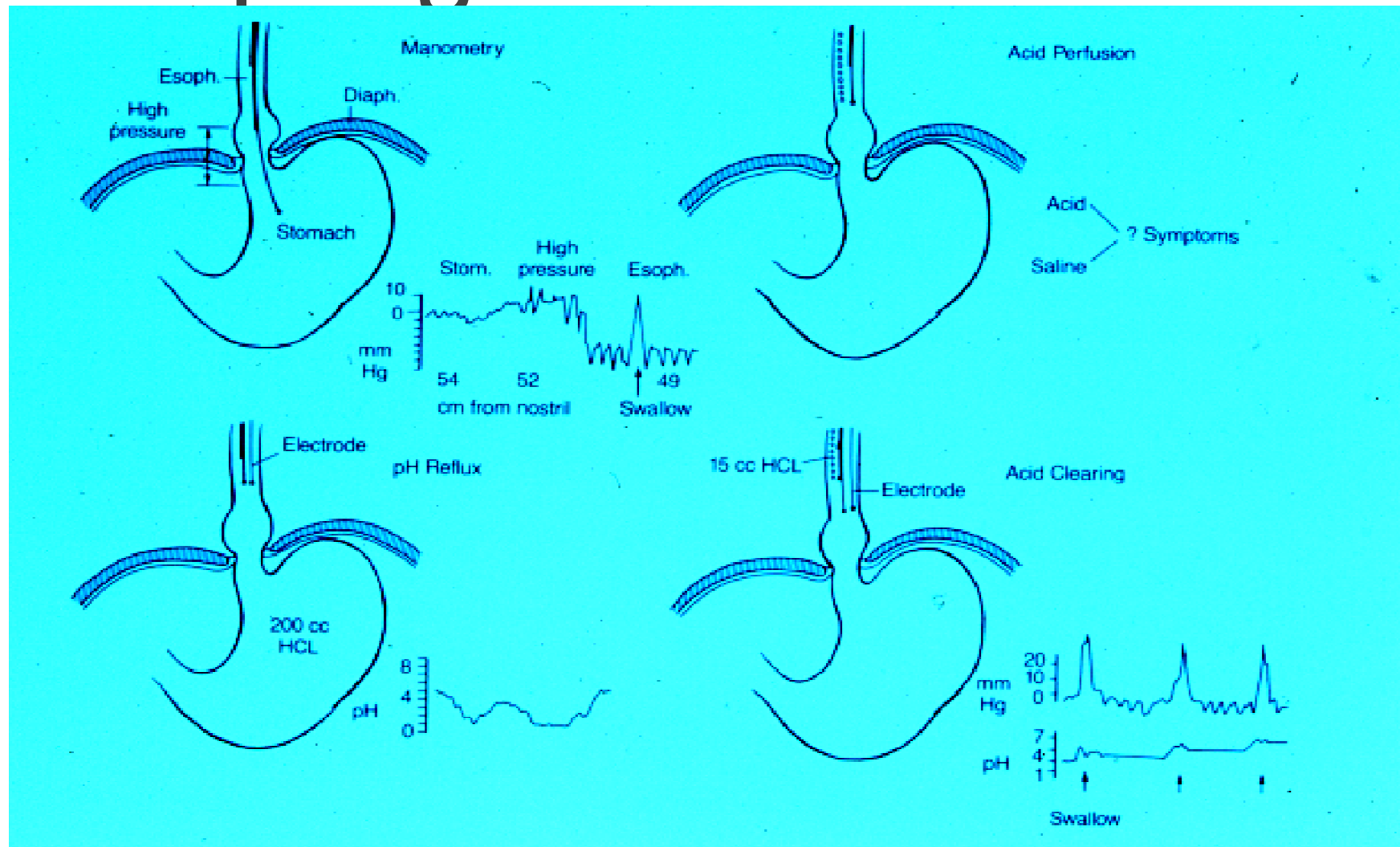
Esophageal Dysmotility



Factors Affecting Reflux



Esophageal Function Tests



Hiatus hernia

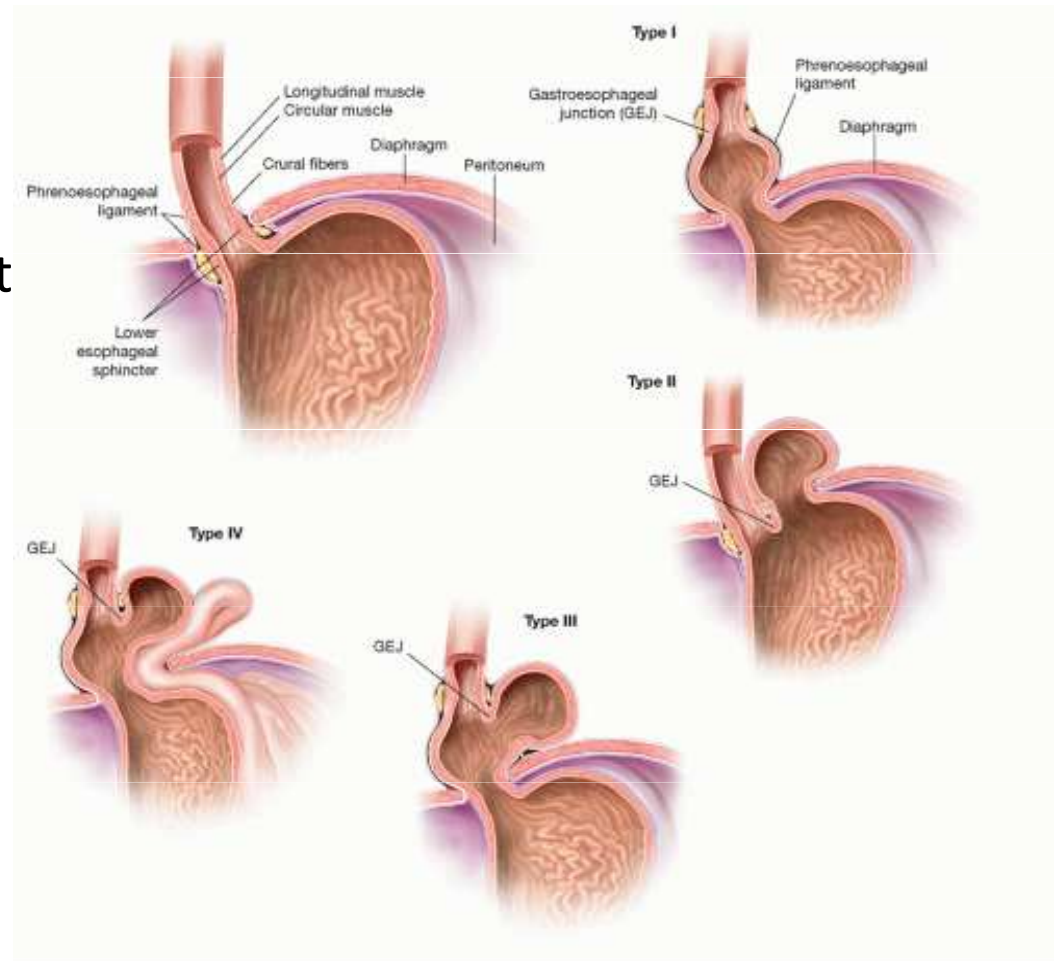
Pathophysiology & Classification

Type I - sliding

Type II - paraesophageal

Type III - para and sliding component

Type IV - other viscera involved



Clinical Presentation

- postprandial fullness (63%),
- Reflux (31%),
- Dysphagia (34%),
- Bleeding (24%)
- Regurgitation/vomiting (36%)
- Dyspnea (11%)

Hiatus Hernia - Clinical Presentation

- Sliding hiatal hernias are more common than paraesophageal hernias by 100:1
- The lower esophageal sphincter mechanism becomes incompetent
- Reflux of acid gastric juice produces a chemical burn
- Degree of mucosal injury is a function of the duration of acid contact and not a disease of hyperacidity

Hiatus Hernia - Clinical Presentation

- Continued inflammation of the distal esophagus may lead to mucosal erosion, ulceration, and eventually scarring and stricture
- Predominantly in women who have been pregnant
- Men and women with increased intraabdominal pressure

Clinical Presentation – Type I hernia

- Type I hiatal hernia with reflux is frequently found in patients who are overweight.
- Many patients with type I hiatal hernia have no symptoms.
- A burning epigastric or substernal pain or tightness
- Usually the pain does not radiate
- May be described as a tightness in the chest and can be confused with the pain of myocardial ischemia

Hiatus Hernia - Clinical Presentation

- Worse when the patient is supine or leaning over
- Antacid therapy frequently improves the symptoms.
- A lump or feeling that food is stuck beneath the xyphoid
- Alcohol, aspirin, tobacco, and caffeine, may exacerbate the symptoms
- Late symptoms of dysphagia and vomiting usually suggest stricture formation

Hiatus Hernia - Clinical Presentation

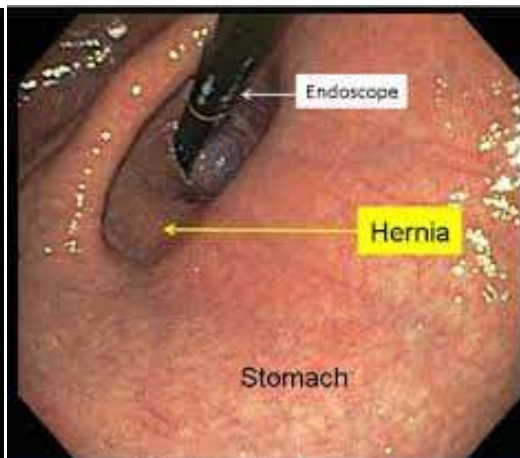
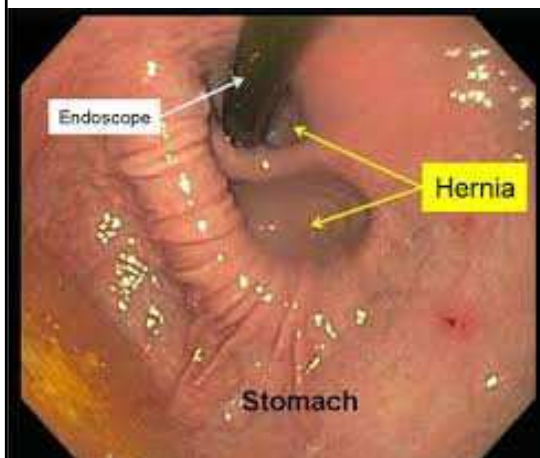
Type II hernias

- Generally produce no symptoms until they incarcerate and become ischemic
- Dysphagia, bleeding, and occasionally respiratory distress are the presenting symptoms.

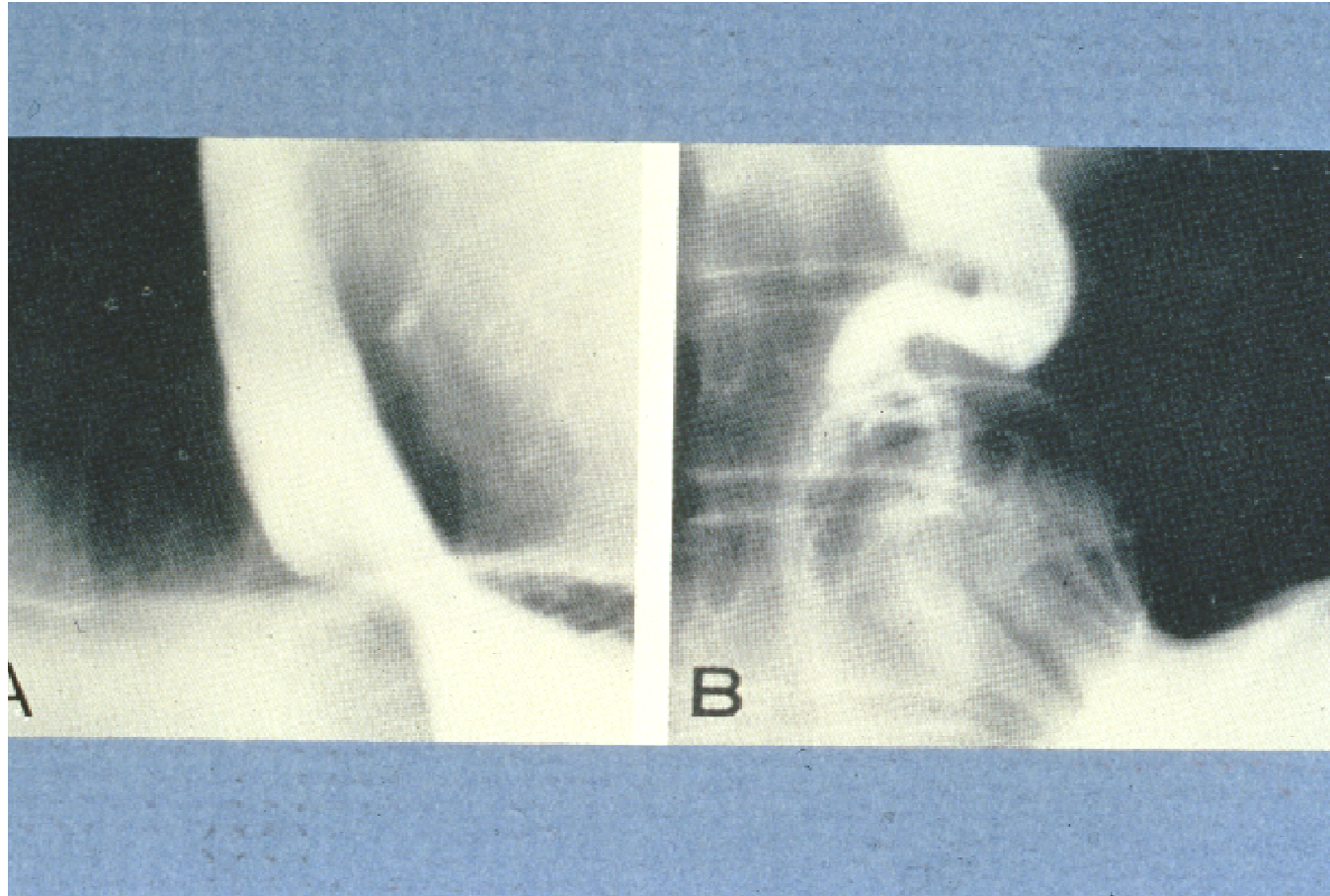


Diagnosis- Hiatus Hernia

- Usually suspected based on the patient's history
- Weight loss is a feature due to distal esophageal stricture
- Hiatal hernia and reflux esophagitis can be confirmed by fluoroscopy during a barium swallow, GFS, CT scan



Barium Swallow – Type I hiatus Hernia



Diagnosis – Hiatus Hernia

- Esophagogastric endoscopy and biopsy of the inflamed esophagus
- Manometry may show a loss of the lower esophageal high-pressure area



Treatment – Hiatus Hernia

Medical Therapy

- 1.Avoidance of gastric stimulants (coffee, tobacco, and alcohol).
- 2.Elimination of tight garments that raise intraabdominal pressure, such as girdles or abdominal binders.
- 3.The regular use of antacids (coat the esophagus), and antacid mints (Tums and Rolaids) to provide a steady stream of protection.
- Proton pump inhibitors (omeprazole) to increase the pH of the refluxed gastric juice
- Metoclopramide to stimulate gastric emptying without stimulating gastric, biliary, or pancreatic secretions

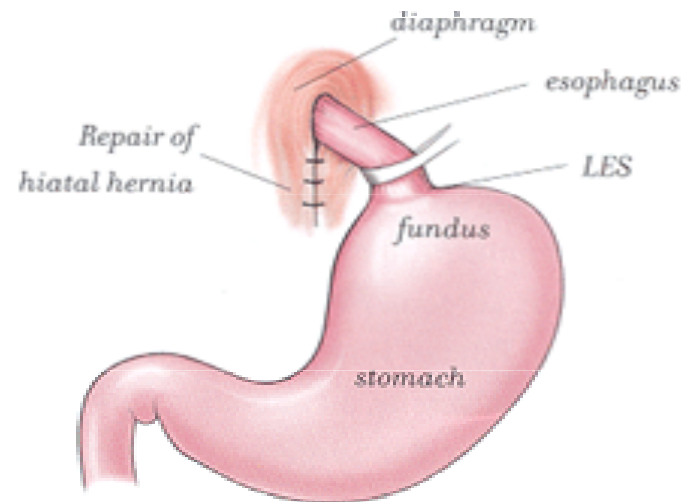
Treatment – Hiatus Hernia

- 4. Abstinence from drinking or eating within several hours of sleeping.
- 5. Sleeping with the head of the bed elevated to reduce nocturnal reflux.
- 6. Weight loss in obese patients.

About one third of patients fail to respond to initial medical treatment, and half of those who initially respond will ultimately relapse and require surgery.

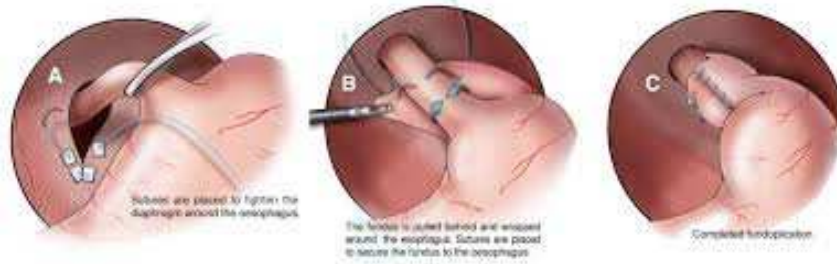
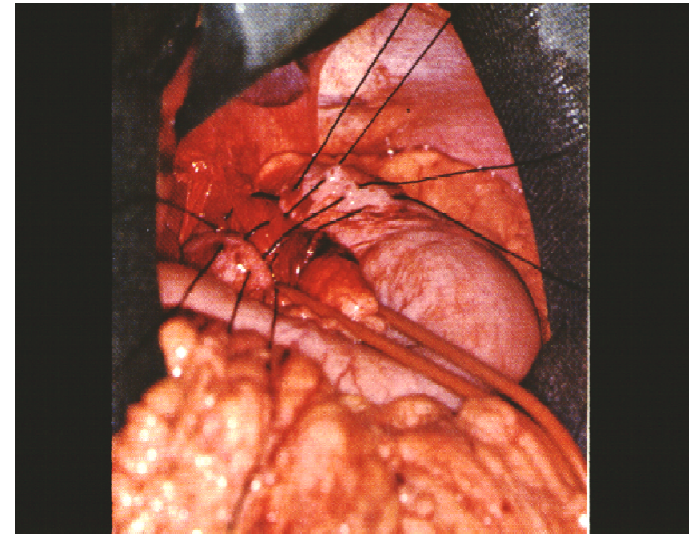
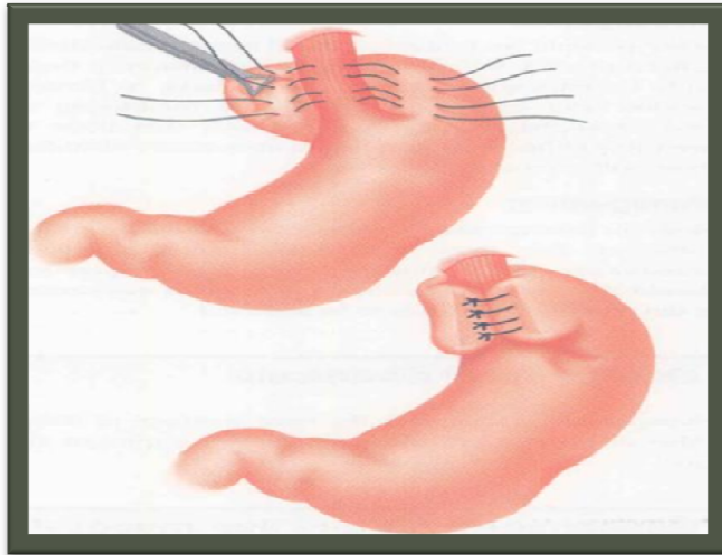
Treatment Hiatus Hernia -- Surgical

- Correct the anatomic defect
- Prevent the reflux of gastric acid into the lower esophagus by reconstruction of a valve mechanism



Fundoplication operation

The gastric fundus is wrapped around the abdominal esophagus



Hiatus Hernia

Complications post surgery

- **inability to belch or vomit- the "gas-bloat" syndrome**
- **Dysphagia**
- **Disruption of the repair with recurrent symptoms**
- **intraabdominal infection**
- **esophageal perforation**
- **Splenic injury**

Achalasia

Epidemiology

- 1-2 per 200,000 population
- usually presents between ages 25 to 60
- male=female
- Caucasians > others
- average symptom duration at diagnosis:
2-5 years



Pathophysiology

- degeneration of NO producing inhibitory neurons
- loss of ganglionic cells in the myenteric plexus (distal to proximal)
- vagal fiber degeneration
- underlying cause: unknown
- autoimmune? (antibodies to myenteric neurons in 50% of patients)
- that affect relaxation of LES
- Basal LES pressure rises

Mechanical End Result

- dual disorder
 - LES fails to appropriately relax
 - resistance to flow into stomach
 - not spasm of LES* but an increased basal LES pressure often seen (55-90%)
 - loss of peristalsis in distal 2/3 esophagus

Clinical Presentation

- clinical presentation
 - solid dysphagia 90-100% (75% also with dysphagia to liquids)
 - post-prandial regurgitation 60-90%
 - chest pain 33-50%
 - pyrosis 25-45%
 - weight loss
 - nocturnal cough and recurrent aspiration

Diagnostic Work Up

- plain film (air-fluid level, wide mediastinum, absent gastric bubble, pulmonary infiltrates)
- barium esophagogram (dilated esophagus with taper at LES)
Bird peak good screening test (95% accurate)
- endoscopy +endosonography (rule out GE junction tumors, esp. age>60)
- esophageal manometry (absent peristalsis, ↓ LES relaxation, & resting LES >45 mmHg)

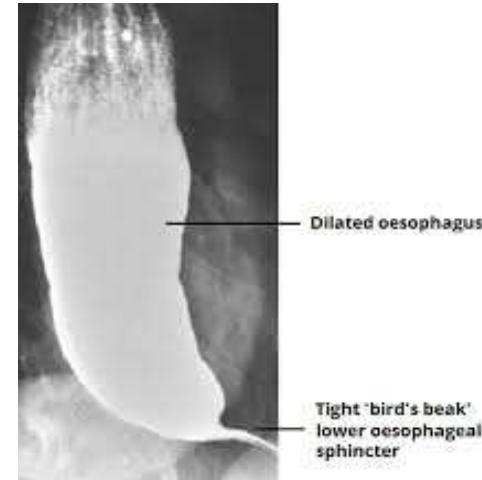
Esophageal Motility Disorders

Achalasia -- Diagnosis

- Generally first confirmed roentgenographically by contrast studies of the esophagus

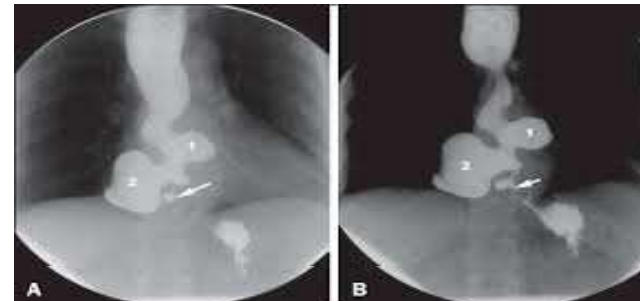
- Dilation of the proximal esophagus is classic

- Esophageal diverticula may be present at any level



- Endoscopy -- one needs to be particularly careful to avoid diverticular perforation

- Esophageal manometry



Esophageal Motility Disorders

Achalasia -- Diagnosis

Endosonography

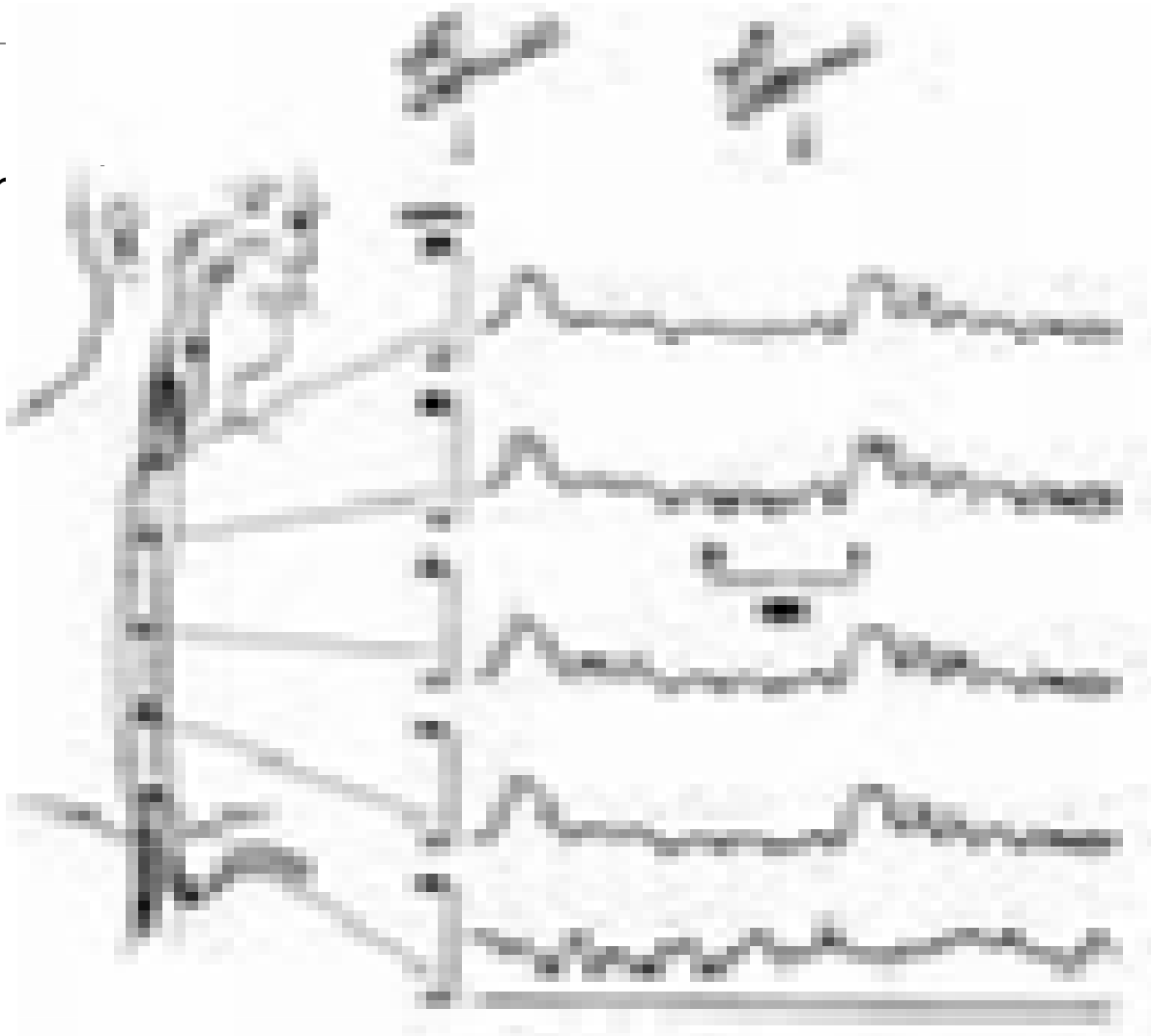


Manometric Features

Incomplete LES relaxation

Elevated resting pressure (>45 mmHg)

Aperistalsis of esophageal body



Esophageal Motility Disorders

Achalasia -- Treatment

- Medical treatment has generally not been helpful
- Invasive endoscopic procedure --forceful dilation
- Application of botulinum toxin
- Surgical transaction of the muscle -- esophageal kardiomyotomy- Heller

Goals

- *reduce LES pressure and*
- *increase emptying*

Nitrates and Calcium Channel Blockers

- Isosorbide dinitrate

Reduces LES Pressure 66% for 90 min

- Nifedipine

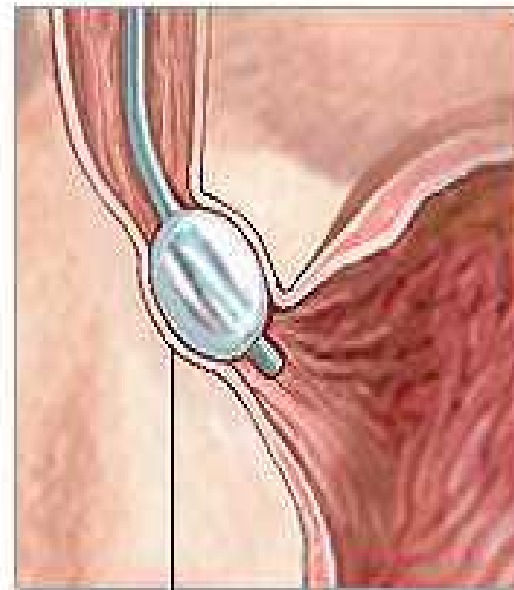
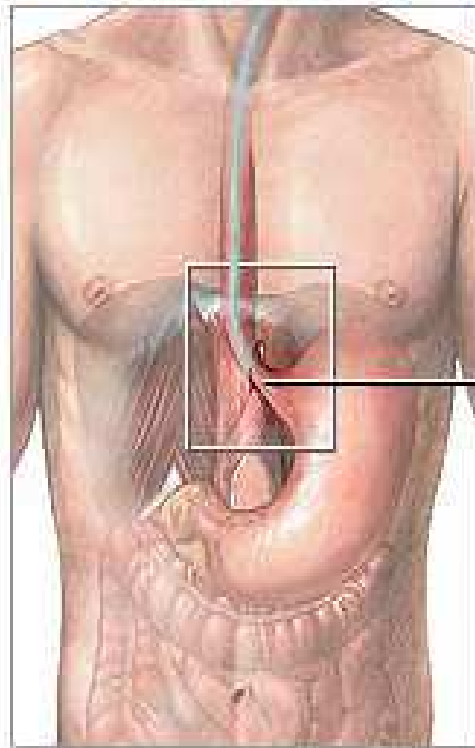
Reduces LES pressure 30-40% for > 60 minutes

50-70% initial response; <50% at 1 year
limitations: tachyphylaxis and side-effects

Pneumatic Dilatation

- Balloon dilatation to 300 psi
- disrupt circular muscle
- 60-95% initial success; 60% at 5 years
- recent series suggest 20-40% will require re-dilatation
- Success increases with repeat dilatations
- risk of perforation 1-13% (usually 3-5%); death 0.2-0.4%

Balloon dilation of
the lower esophageal
sphincter



Lower esophageal
sphincter

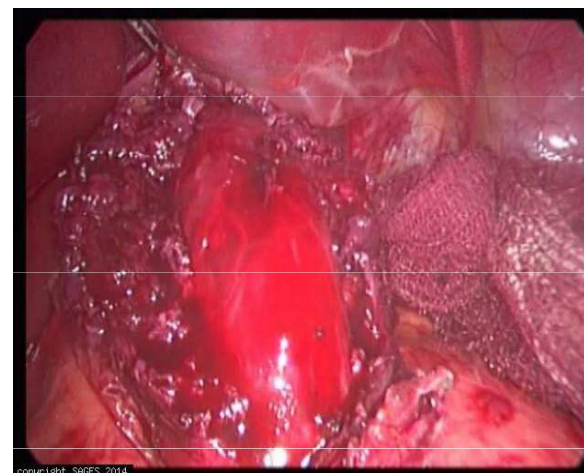
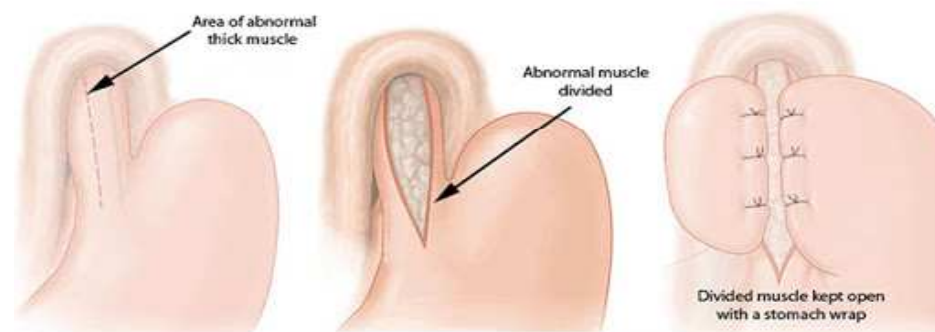
adam.com

Botulinum Toxin

- 90% initial response; 60% at 1 year
- Needs repetitive sessions

Surgical Treatment

- surgical myotomy (open or minimally-invasive)
 - >90% initial response; 85% at 10 years; 70% at 20 years (85% at 5 years with min. inv. techniques)
 - <1% mortality; <10% major morbidity
 - 10-25% acutely develop reflux, up to 52% develop late reflux



Esophageal Motility Disorders

Esophageal Diverticulum

- The second most common manifestation of esophageal motility disorders

- *Pulsion or Traction*, depending on the mechanism that leads to their development

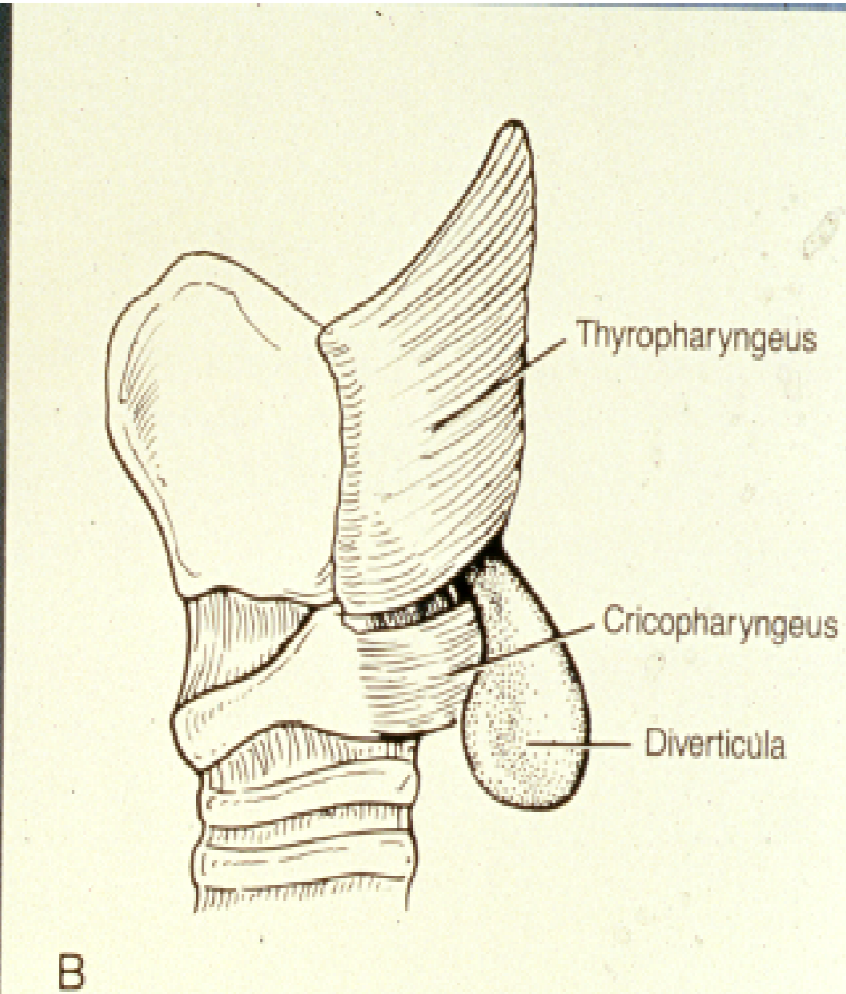
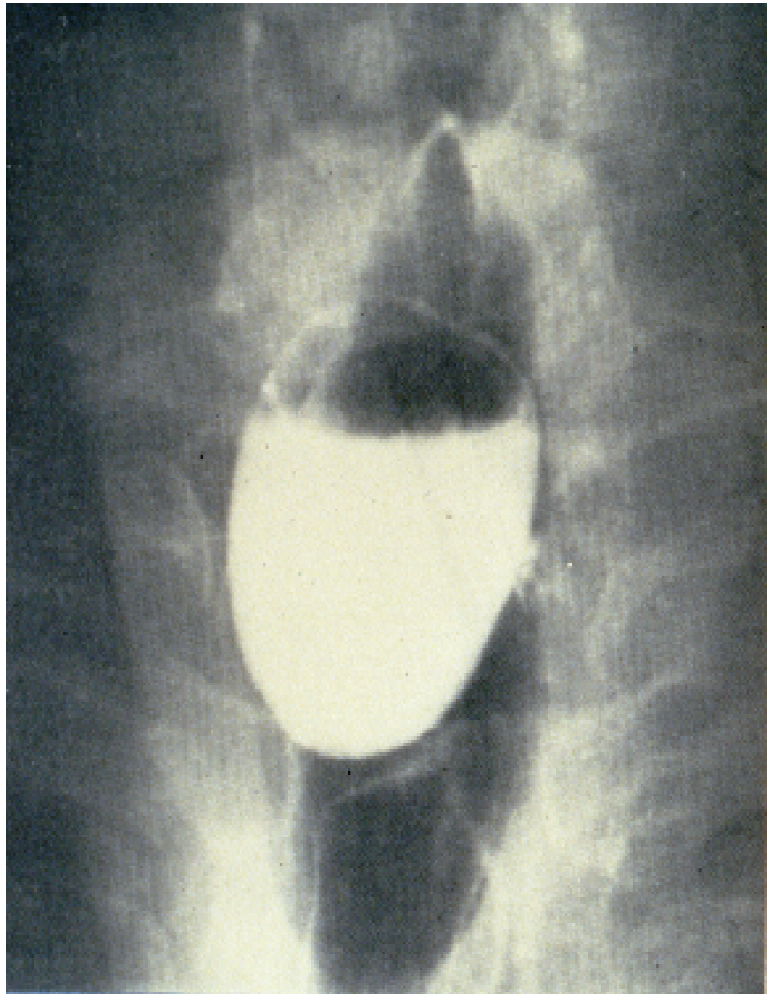
Esophageal Motility Disorders

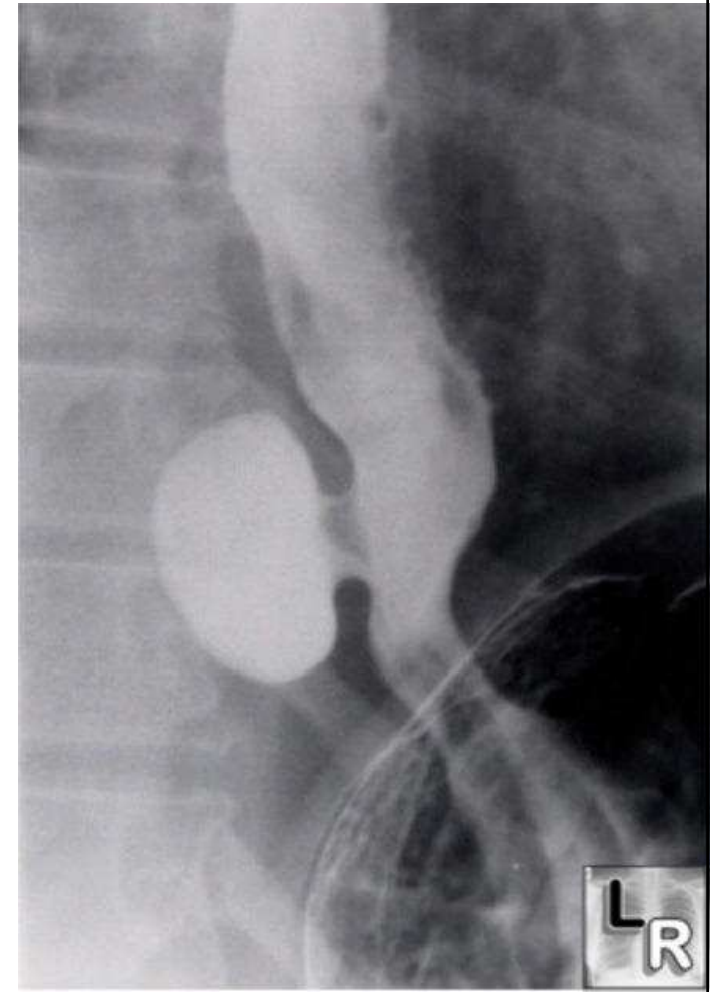
Esophageal Diverticulum

- Upper third cervical esophageal diverticula - usually pulsion
- Cervical diverticula, or Zenker's -- pulsion and are closely related to dysfunction of the cricopharyngeal muscle
 - a) complain of regurgitation of recently swallowed food or pills, choking, or a putrid breath odour**
 - b) treated by excision of the diverticula and myotomy of the cricopharyngeal muscle**

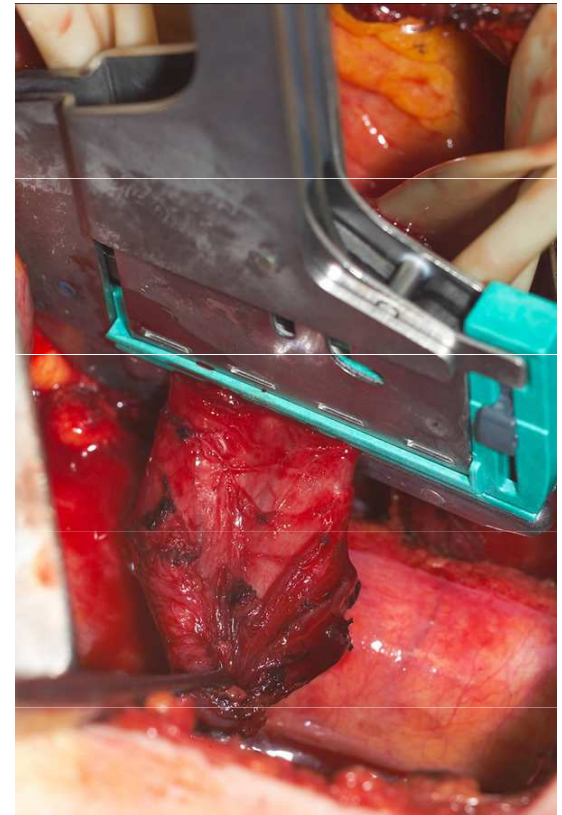
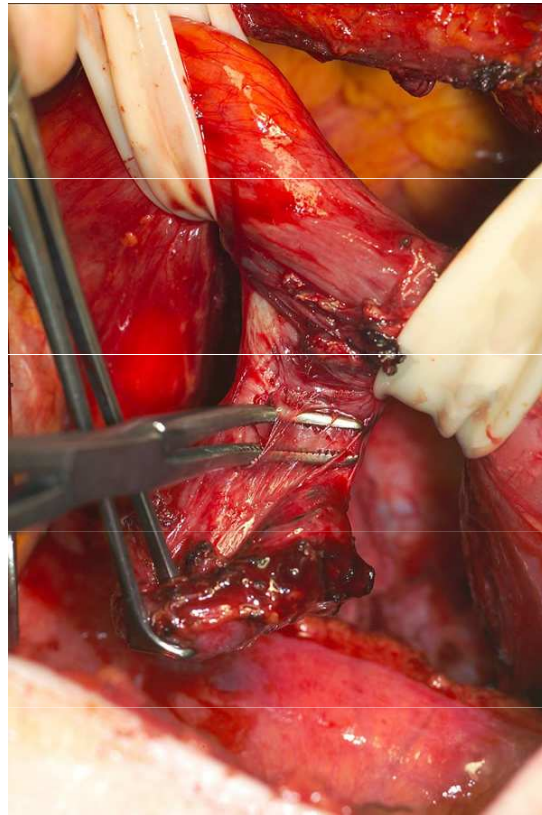
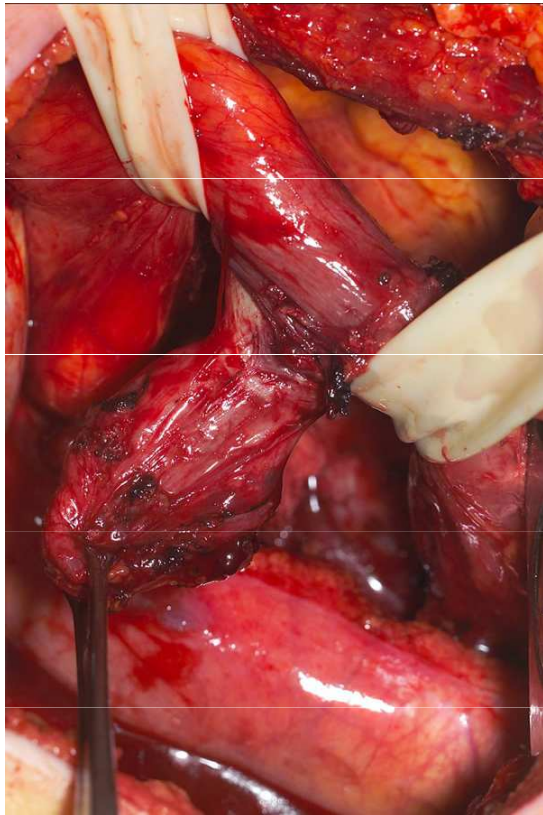
Esophageal Motility Disorders

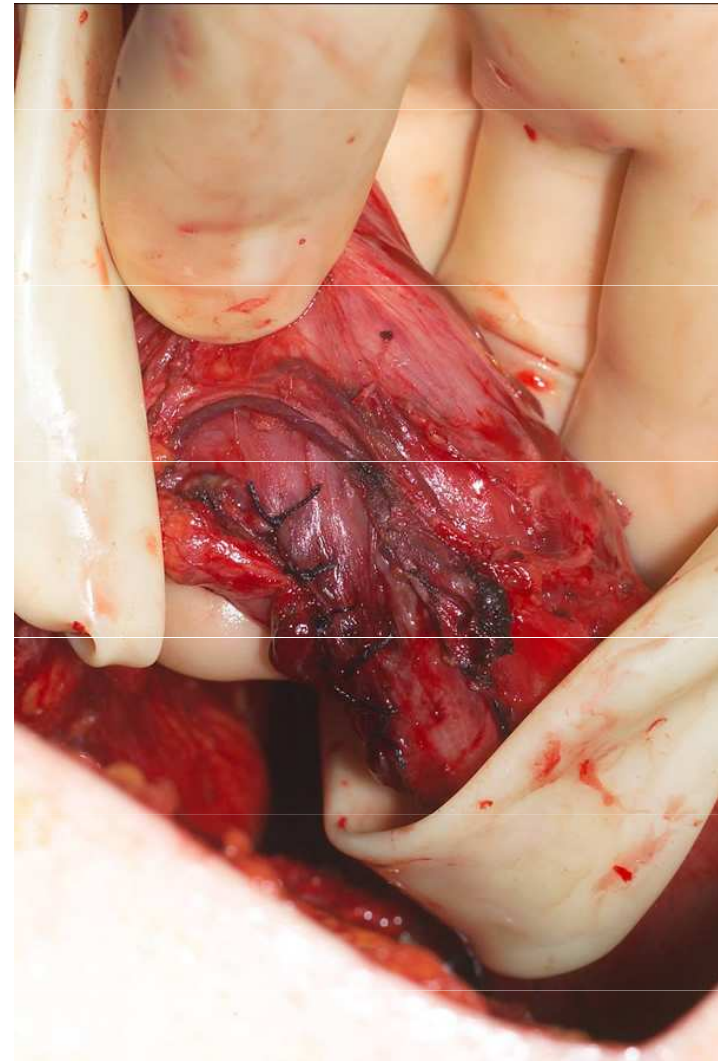
Esophageal Diverticulum – Zenker's





Zenker's diverticulum resection





Esophageal Motility Disorders

Esophageal Diverticulum

– Middle-third esophageal diverticula are almost always traction, not related to an intrinsic abnormality in esophageal motility

a) Result of mediastinal inflammation (usually

inflammatory nodal disease from tuberculosis or

histoplasmosis, with formation and subsequent

contracture that places "traction" on the esophagus

b) Usually asymptomatic and do not warrant

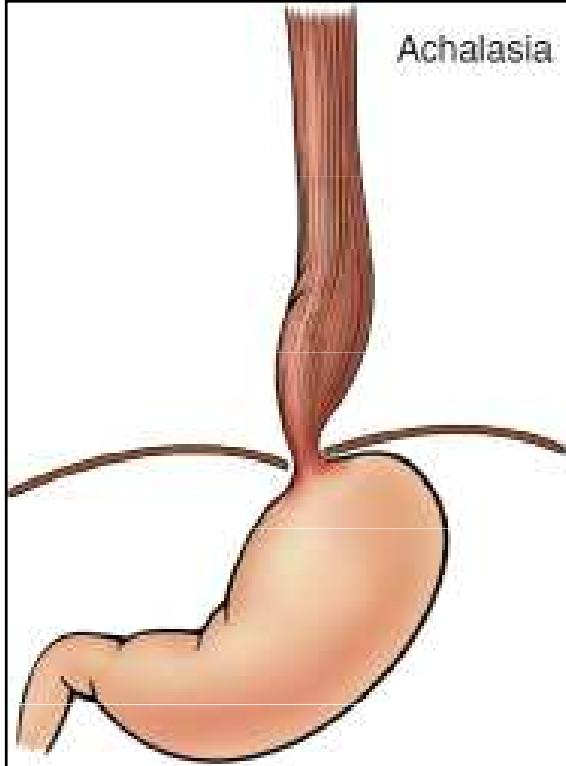
treatment.

Esophageal Motility Disorders

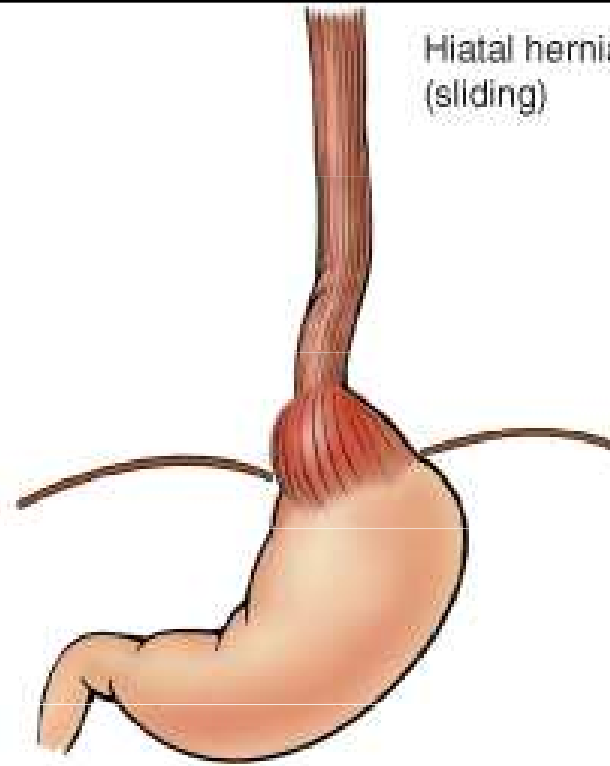
Esophageal Diverticulum

- Diverticula of the distal third of the esophagus
 - a) associated with dysfunction of the esophagogastric junction due to chronic stricture from acid reflux, antireflux surgical procedures, achalasia
 - b) Excision of these diverticula should always be accompanied by correction of the underlying pathologic process

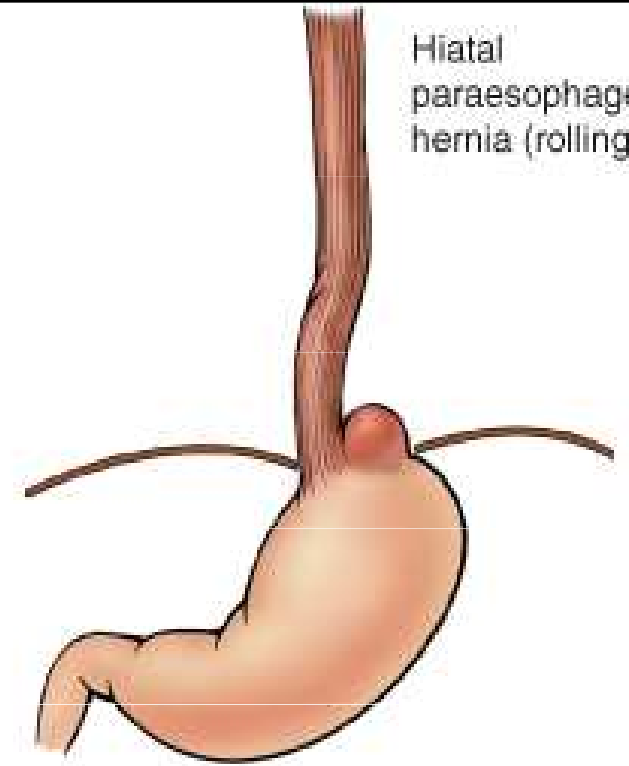
Achalasia



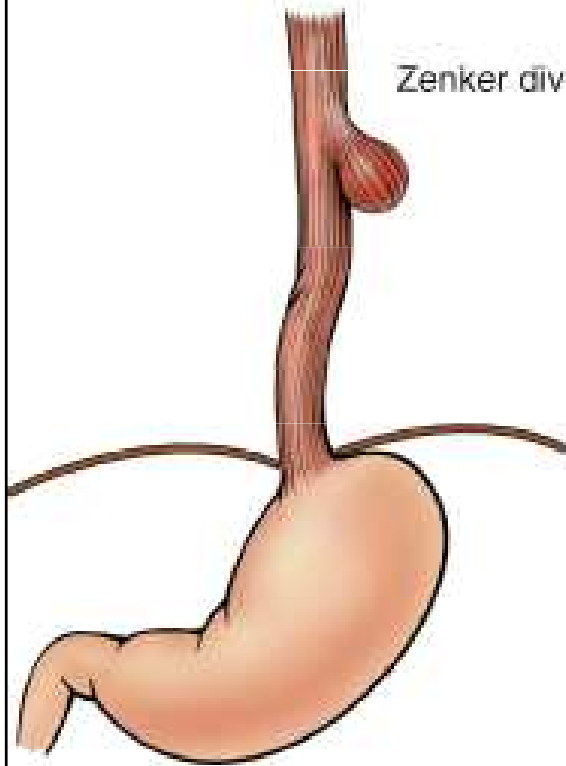
Hiatal hernia (sliding)



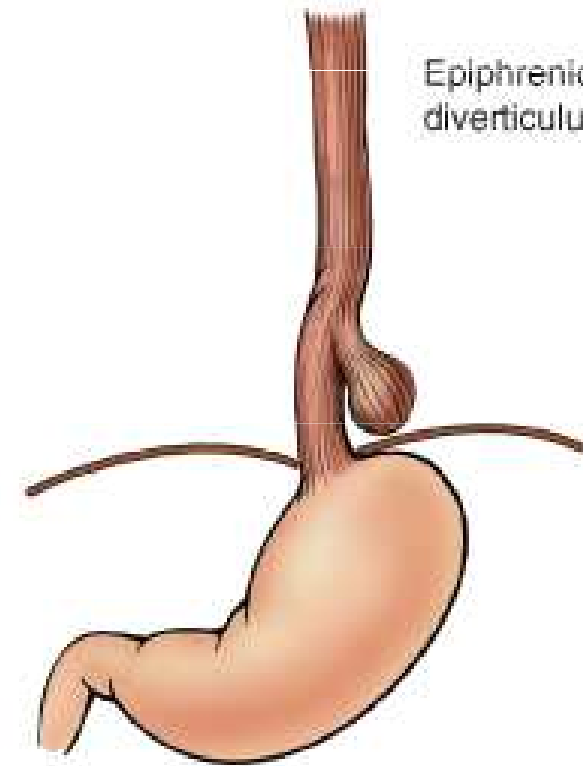
Hiatal paraesophageal hernia (rolling)



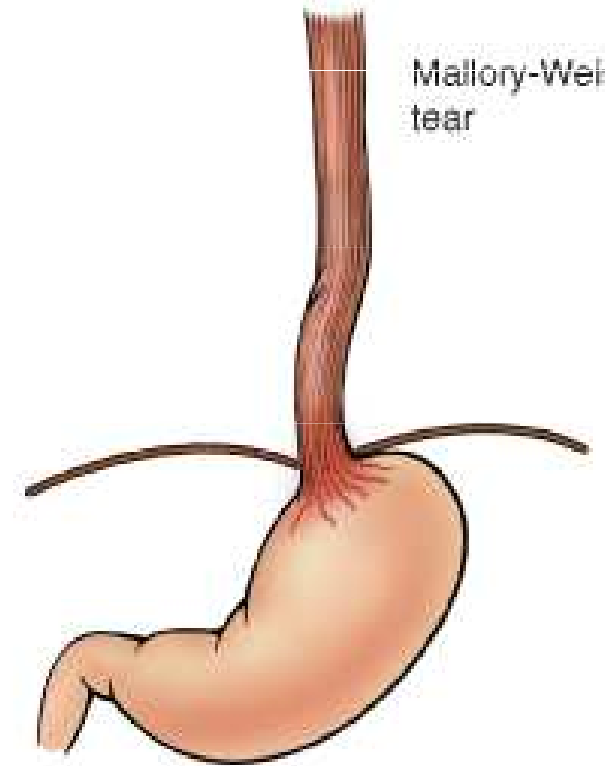
Zenker diverticulum



Epiphrenic diverticulum



Mallory-Weiss tear



Traumatic Esophageal Disorders Perforation.

- Instrumentation by endoscopic and/or biopsy
- Passage of blind nasogastric tubes
- Instruments designed for dilation of strictures
- Sengstaken-Blakemore tubes, balloon dilation for achalasia
- *Boerhaave's syndrome* -- spontaneous perforation secondary to forceful vomiting (Plummer-Vinson)
- Treatment requires aggressive surgical intervention

Traumatic Esophageal Disorders

Perforation -- Symptoms

- May be dramatic or occult
- Profound shock
- Mediastinal sepsis
- Subcutaneous emphysema
- Severe chest or abdominal pain
- Hypotension
- Diaphoresis
- Nausea/Vomiting